earthquakes

The U.S. Geological Survey defines an earthquake as "both sudden slip on a fault [a crack in the earth's crust caused by the displacement of one side with respect to the other] and the resulting ground shaking and radiated seismic energy caused by the slip, by volcanic or magmatic activity, or other sudden stress changes in the earth." Utah experiences about 700 earthquakes every year, the majority of which are not felt by people and do not cause any damage (Bolt 1986).

There are many hazards associated with earthquakes. These include ground shaking, fault rupture and ground deformation, liquefaction, slope failure and avalanches, flooding, fires, and hazardous material situations. Ground shaking is a result of the seismic vibrations caused by the earthquake. This ground shaking can cause objects to fall and buildings to collapse. Fault rupture and ground deformation happens when the ground at or near the fault is broken and drops, causing damage to buildings on or near the fault. Liquefaction occurs when sandy, water saturated soils temporarily act like a liquid in response to the vibrations caused by the earthquake. Development in valleys bordering the mountain ranges across the State are at risk of being damaged by liquefaction. Slope failures, such as landslides and avalanches, can cause damage to buildings, depending on the magnitude of the earthquake and slope conditions. Dam failures, flooding, fire, and hazardous materials spills may also result with significant consequences from an earthquake (Bolt 1986).

Proper planning can do much to reduce the risks associated with earthquakes. Mapping fault lines and liquefaction zones is an important part of this planning. Re-directing development to avoid fault lines will reduce risk of damage during an earthquake. Engineering buildings to withstand the shaking, liquefaction, and other hazards associated with earthquakes can reduce the costs associated with damage.

Building on or near a fault line can cause major damage if an earthquake occurs.

references and further reading:

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